Federal Energy Management Program

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

July 2011 Open Meeting of the Renewable Energy Working Group

Anne Crawley

Technology Manager

Agenda

- 2:45 to 2:55 Greetings and Introductions
- 2:55 to 3:15 Preliminary 2010 data on renewable energy goals, agency scorecard results (Anne Crawley)
- 3:15 to 3:40 REWG Plans for Coming Year
  - Overview of RE Technology Cost/Performance Matrix (Boyan Kovacic)
  - RE Planning and Assessment Tools Discussion
  - EISA Final Rules
- 3:40 to 3:45 Plans for Next Meeting, Reminder for GovEnergy
- The call-in for the open meeting is: 202-287-1373

2010 Renewable Energy Use, Preliminary Figures

- Based on 2010 submissions that are still preliminary until the reports pass DOE internal review:
  - The Federal government as a whole just met the goal of 5% of facility electricity from renewable energy
  - Renewable Energy Certificate Purchases continued to play a very large role, but on-site systems (with their bonuses) are gradually expanding
  - Most agencies met the goal, but not all
  - A lot of progress is needed to reach 7.5% by 2013

2010 Renewable Energy Use, Preliminary Figures

- For the first time agencies reported GHG emissions
  - Renewable energy an important part of reporting
  - GHG targets will help sustain demand for renewable energy
  - Data and Scorecards available to public:
  - Data: http://explore.data.gov/Geography-and-Environment/FY2010-Federal-Government-Greenhouse-Gas-Inventory/vzm3-edjq
  - Scorecards: http://www.whitehouse.gov/administration/eop/ceq/sustainability/omb-scorecards
- Highlights, 28% reduction in Scope 2 and 13% from Scope 3 compared to 2008 baseline
  - Scope 1&2 emissions of 49,193,107 MTCO2e
    - Renewable energy reduced emissions by 1,728,143 MTCO2e
  - Scope 3 emissions of 17,228,745 MTCO2e

Agency Scorecards, Progress

	Renewable Energy	Scope 1&2 GHG	Scope 3 GHG
USDA			
Commerce			
Defense			
Education	NA		
Energy			
HHS			
HUD			
DHS			
Interior			
Justice			
Labor			
State			

Agency Scorecards, Progress, Continued

	Renewable Energy	Scope 1&2 GHG	Scope 3 GHG
Treasury			
Transportation			
VA			
EPA			
GSA			
NASA			
Archives			
OPM			
Smithsonian			
SSA			
TVA			
USACE			

Technology Cost/Performance Matrix

http://www.nrel.gov/analysis/tech_cost_dg.html

Distributed Generation Energy Technology Capital Costs

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The following charts indicate the range of recent capital cost estimates for distributed generation (DG) renewable energy technologies. The estimates are shown in dollars per installed kilowatts of generating capacity.

The charts provide a compilation of available national-level cost data from a variety of sources. Costs in your specific location will vary. Review the supporting documentation to understand the data used in these charts.

The green horizontal lines represent the range of costs.

The U.S. Department of Energy (DOE) Federal Energy Management Program (FEMP) sponsored the distributed generation data used within these charts.

Capital Cost	Operations & Maintenance	Capacity Factor	LCOE Calculator
Utility Scale Distributed Generation	Utility Scale Distributed Generation	Utility Scale	

Technology Cost/Performance Matrix

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Distributed Generation Energy Technology Operations and Maintenance Costs

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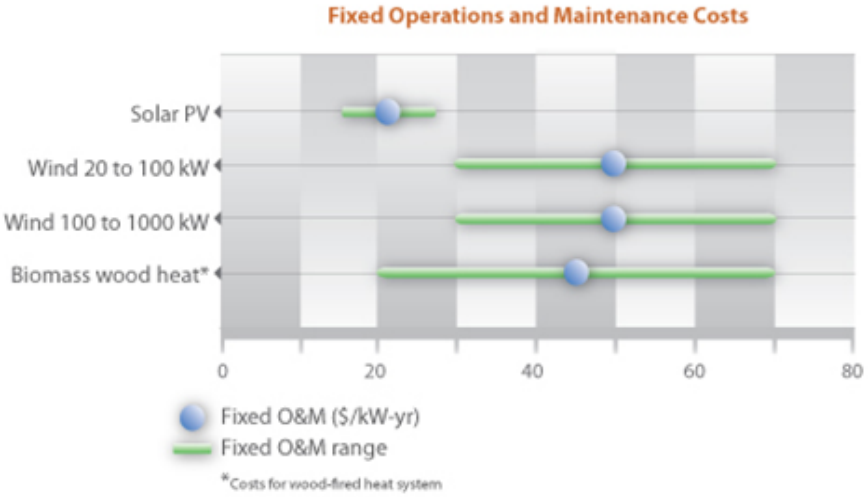
The following charts indicate the range of recent operations and maintenance (O&M) cost estimates for distributed generation (DG) renewable energy technologies.

The charts provide a compilation of available national-level cost data from a variety of sources. Costs in your specific location will vary. Review the supporting documentation to understand the data used in these charts.

The horizontal lines represent the range of costs.

The U.S. Department of Energy (DOE) Federal Energy Management Program (FEMP) sponsored the distributed generation data used within these charts.

Capital Cost	Operations & Maintenance	Capacity Factor	LCOE Calculator
Utility Scale Distributed Generation	Utility Scale Distributed Generation	Utility Scale	



Technology Cost/Performance Matrix

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Levelized Cost of Energy Calculator

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The levelized cost of energy (LCOE) calculator provides a simple calculator for both utility-scale and distributed generation (DG) renewable energy technologies that compares the combination of capital costs, operations and maintenance (O&M), performance, and fuel costs.

Note that this does not include financing issues, discount issues, future replacement, or degradation costs. Each of these would need to be included for a thorough analysis.

To estimate simple cost of energy, use the slider controls or enter values directly to adjust the values. The calculator will return the LCOE expressed in cents per kilowatt-hour (kWh).

The U.S. Department of Energy (DOE) Federal Energy Management Program (FEMP) sponsored the distributed generation data used within this calculator.

Capital Cost	Operations & Maintenance	Capacity Factor	LCOE Calculator
Utility Scale Distributed Generation	Utility Scale Distributed Generation	Utility Scale	

Simple Levelized Cost of Energy Calculator

Financial

Periods (Years): 20 ?

Discount Rate (%): 4.0 ?

Renewable Energy System Cost and Performance

Capital Cost ($/kW): 1050 ?

RE Assessment Tool Discussion

- **NREL Tools Webpage:** http://www.nrel.gov/applying_technologies/models_tools.html
- **Renewable Energy Optimization (REO) tool**—analyzes a variety of data to identify the optimal combination of renewable energy technologies needed to enable facilities to achieve "net-zero" status, or produce as much energy as they consume, while minimizing life-cycle cost.
- NREL's **Solar Advisor Model (SAM)**—helps evaluate several types of financing for energy projects that incorporate NREL's Solar Energy Technology Program (SETP) technologies.
- NREL's **BioPower**—is a geographic tool that overlays biomass feedstocks, power plant locations, electricity rates, and other information to help inform decisions about where to locate a biopower facility.
- **HOMER hybrid optimization model**—simulates hour-by-hour operation of renewable energy systems and load profiles to evaluate the economic and technical feasibility of various conventional and renewable energy technologies, ranking the feasibility of different configurations according to total net present cost. This tool is now available from HOMER Energy.

EISA Fossil Fuel Reduction and SWH in New Construction

- EISA 2007 Section 433(a) amended section 305 of NECPA :
  - Fossil generated energy consumption has to be 55% less starting in FY10, gradually increasing to 100% less by 2030 compared to 2003 baseline based on CBECS and RECs surveys
  - Applies to new construction and major renovations where GSA is required to submit a prospectus, or $2.5M
- Sec. 523 amends section 305 of NECPA to require not less than 30% of hot water demand for new buildings or major renovation come from solar hot water heaters, if cost-effective

EISA Fossil Fuel Reduction and SWH in New Construction

- DOE took public comments on proposed rule to implement provisions in November and December 2010.
- A final rule may be available this fall
- Renewable energy and RECs were an important issue in NOPR and comments, final rule could have important influence on renewable energy in new buildings

Future Topics and Plans

- What would be the most productive use of future open REWG meetings?
- What would help non-Federal participants?
- What new requirements do you see on the horizon?

GovEnergy August 7-10, 2011

- **Federal On-Site Renewable Power Purchase Agreement Contract Challenges & Case Studies in Success**
  Date: Sunday, August 7, 2011
  Time: 1:00 pm - 4:30 pm
  Location: Duke Energy Convention Center, Room: Ballroom C
- **Wind 101 Workshop**
  Date: Sunday, August 7, 2011
  Time: 1:00 pm – 5:00 pm
  Location: Duke Energy Convention Center, Room: Ballroom B
- **Integrating Renewable Energy into Federal Construction Workshop**
  Date: Sunday, August 7, 2011
  Time: 1:00 pm – 5:00 pm
  Location: Duke Energy Convention Center, Room: 203